REMARKS

Claims 1-5, 7-11, and 13-20 are pending in the application, of which Claims 1, 10, and 16 are independent. In the final Office Action mailed June 25, 2008, Claims 1-2, 4-5, 7-11, 13, and 15-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,283,033, issued to Dodrill, (hereinafter "Dodrill") in view of U.S. Patent No. 6,177,048, issued to Lagerstedt, (hereinafter "Lagerstedt"). In addition, Claims 3 and 14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dodrill, in view of Lagerstedt, and in further view of U.S. Patent No. 4,667,454, issued to McHenry et al., (hereinafter "McHenry").

In view of the remarks set forth below, applicant respectfully submits that the pending claims are in condition for allowance.

Rejections Under 35 U.S.C. § 103(a) in View of Dodrill and Lagerstedt

In the Office Action, Claims 1-2, 4-5, 7-11, 13, and 15-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Dodrill, in view of Lagerstedt. For at least the reasons set forth below, applicant respectfully submits that the rejected claims are allowable over a theoretical combination of Dodrill and Lagerstedt.

Dodrill

Dodrill is directed to a process for controlling the pressure in a processing tank or vessel used for heating and cooling deformable sealed packages having volatile contents. The container to be processed is sealed and placed in a processing vessel having a regulated interior pressure. (Col. 6, lines 32-33). During the "come up" phase, in which the heating medium of the processing tank is being heated to sterilization temperature, the pressure in the processing tank is maintained at a pressure equal to or about the sum of the partial pressure of air (or gas) and partial saturated water (or volatile material) vapor pressure inside the package. (Col. 5,

lines 26-30). During "come up," the partial pressure of air for all temperatures is calculated using the ideal gas law, and the partial saturated water vapor pressure is calculated at the highest temperature of the contents of the package. (Col. 5, lines 30-35). The highest temperature of the contents is used because it controls the rate of vaporization of water or volatile material. (Col 5, lines 35-37). Dodrill refers to the highest temperature of the contents during "come up" as T_1 and defines T_1 as the "saturated water or volatile material vapor equilibrium temperature during the 'come-up' and processing phases." (Col. 9, lines 13-15).

After the package and its contents have reached the predetermined sterilization temperature, the pressure inside the process tank is maintained equal to about the sum of the partial pressure of air (or gas) and the partial saturated water (or volatile material) vapor pressure inside the package. (Col. 5, lines 53-58). During this sterilization or "processing" phase, the partial pressure of air is calculated using the ideal gas law at the average temperature of the headspace, T_a, and the partial saturated water vapor pressure is again calculated at the highest temperature of the contents, typically measured at or near the sides of the package at or just below the surface of the contents. (Col. 5, lines 58-64).

After the contents and the package have been maintained at the sterilization temperature for a predetermined period of time, both the contents and the package are cooled. (Col. 5, lines 65-68). During this "come-down" phase, the pressure inside the processing tank is maintained at about the sum of the partial pressures of the air (or gas) and the partial saturated water (or volatile material) vapor pressure inside the package. (Col. 5, line 68-Col. 6, line 4). The partial pressure of air is calculated using the ideal gas law at the average temperature of the headspace, and the partial saturated water vapor pressure is calculated at the lowest temperature inside the package, typically the undersurface of the lid of the package. (Col. 6, lines 4-9). Dodrill refers to the lowest temperature of the contents during "come-down" as T_2 and defines T_2

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as the "saturated water or volatile material vapor equilibrium temperature during the "come-down" phase." (Col. 9, lines 16-17.)

With regard to the temperature and pressure inside the container, Dodrill notes the following:

> While FIG. 1 is a simplified representation of the temperature and pressure conditions during the "come-up" phase, processing and "come-down" phases, *in reality, the temperature of the food or other contents does not respond instantaneously to the retort water temperature.* Also, the temperatures and pressures inside the package do not remain constant during the early stages of the processing cycle. (Col. 10, lines 25-32) (emphasis added).

Lagerstedt

Lagerstedt teaches a method for sterilizing a fiber based container filled with a food product. The method includes a cooling phase for the sterilization process during which the container is cooled with a medium not containing water, preferably air, until the container reaches the critical temperature. (Col. 3, lines 64-67.) When the container reaches critical temperature, the cooling medium not containing water is exchanged for water, which further cools the container. Lagerstedt further discloses that introducing the medium not containing water into the autoclave causes a reduction in the pressure of the autoclave. (Col. 2, lines 30-45.)

Claim 1

Independent Claim 1 recites the following:

1. A method of processing a food product in a retort vessel comprising:

(a) placing the food product in a container having a fiber-based material component and sealing the container closed, the container having at least one exposed edge of paperboard;

(b) placing the closed container in the vessel and cooking the food product therein including regulating the interior conditions of the vessel using a control temperature and a control pressure, the control temperature and control pressure being within the vessel and outside of the closed container; and

(c) cooling the food product within the vessel by reducing the control temperature according to a predefined temperature schedule, said temperature schedule comprising a plurality of predetermined control temperature values;

(d) wherein cooling the food product further includes actively reducing the control pressure according to a predefined pressure schedule; said pressure schedule comprising a plurality of predetermined control pressure values, each control pressure value corresponding to a control temperature value included in the temperature schedule and being less than a theoretical total pressure related to the corresponding control temperature value, the theoretical total pressure being calculated from a theoretical vapor pressure based on the corresponding control temperature and a theoretical partial air pressure based on the corresponding control temperature, thereby helping to prevent moisture from entering into the exposed edge of paperboard, said control pressure values being sufficient to prevent the closed container from bursting.

In the Office Action, the Examiner asserts the following:

> Furthermore, on column 11, lines 60-67, Dodrill teaches that the equilibrium temperature (i.e., temperature within the vessel and the container) is determined and the resultant pressure is determined based on

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this temperature. On column 5, line 53 to column 6, line 6, Dodrill teaches that the package reaches the predetermined sterilization temperature, and the pressure inside the process tank is maintained equal to about the sum of the partial pressure of air and the partial saturated vapor pressure inside the package" using the ideal gas law at the average temperature at the headspace. This is the temperature to which the processing vessel has been set. The pressure during the come-down phase is determined by the sum of the partial pressures of the air and water vapor, which would have been based on this temperature. (Office Action at pages 6-7)(emphasis original).

Applicant respectfully submits that the Examiner's assertion that the term "equilibrium temperature" as applied in Dodrill is the "temperature within the vessel and the container" is in error. In this regard, it appears that the Examiner is asserting that the temperature inside of the package is the same as the temperature inside the vessel but outside of the package when the "package reaches the predetermined sterilization temperature." Having thus effectively defined the "equilibrium temperature" as the sterilization temperature to which the processing vessel has been set, the Examiner further asserts that the pressure during the come-down phase is determined "based on this temperature."

Applicant respectfully submits that the Examiner's interpretation of the term "equilibrium temperature" is inconsistent with the teachings of Dodrill, particularly with respect to the come-down phase, when Dodrill is considered in its entirety. In this regard, Dodrill provides a definition for T_2, wherein "T_2=saturated water or volatile material vapor equilibrium temperature *during the 'come-down' phase*." (Col. 9, lines 13-17)(emphasis added). Dodrill also recognizes that heat transfer from the cooling water used during the come-down stage is not instantaneous,

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and that the time required for the temperature of the package contents to reach temperature of the cooling water depends on the heat transfer properties of the container lid. (Col. 12, lines 16-21). Applicant respectfully submits that during the come-down phase, the temperature inside the container is greater than the temperature inside the vessel but outside of the container. The resulting temperature gradient causes heat to be transferred from inside the container to the cooling water in the vessel, thereby cooling the contents of the container. Given the existence of this temperature gradient, applicant respectfully submits that during the come-down phase, the "equilibrium temperature" disclosed in Dodrill can not be both the temperature inside the container and inside the vessel, as asserted by the Examiner.

Applicant respectfully submits that in the context of Dodrill, "equilibrium temperature" (T_1 during come-up and T_2 during "come-down") instead refers to the temperature at which the water or volatile material in the container exists as both a liquid and gas for a given pressure. Such a reading is consistent with the definition for a "volatile material" provided by Dodrill, wherein a "volatile material" is defined as "a material which will exist as a liquid or solid material under some of the temperature and pressure conditions which the container will experience during the process, *but which has an appreciable equilibrium vapor pressure under the conditions which the container will experience during the process*." (Col. 6, lines 25-31)(emphasis added). Thus, just as "equilibrium vapor pressure" is a characteristic of the volatile material, i.e., the water in the container, under certain conditions, so too is the "equilibrium temperature" described in Dodrill a characteristic of the volatile material/water inside the container under certain conditions. More specifically, applicant submits that in the context of Dodrill, the "equilibrium temperature" is the temperature at which the water/volatile material in the container will exist in both liquid and gas states for a given pressure.

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As previously noted, in the Office Action, the Examiner asserts the following:

> On column 5, line 53, to column 6, line 6, Dodrill teaches that the package reaches the predetermined sterilization temperature, and the pressure inside the process tank is maintained equal to about the sum of the partial pressure of air and the partial saturated vapor pressure inside the package" using the ideal gas law at the average temperature at the headspace. This is the temperature to which the processing vessel has been set. The pressure during the come-down phase is determined by the sum of the partial pressures of the air and water vapor, which would have been based on this temperature. (Office Action at pages 6-7).

It appears that the Examiner is asserting that Dodrill teaches that the pressure inside the tank during the come-down phase is controlled according to the sterilization temperature of the vessel. Applicant respectfully submits that such a reading of Dodrill is in error. Dodrill teaches controlling the pressure inside the vessel during come-down according to the partial vapor pressure in the container (calculated at the highest temperature in the container) and the partial air pressure in the container (calculated at the average temperature of the air or head space in the container). Even assuming, *arguendo*, that the Examiner's assertion is correct, such a method of controlling pressure in the vessel during come-down is quite different from the method recited in Claim 1, wherein pressure inside the vessel is controlled according to a series of predetermined control pressure values, "each control pressure value corresponding to a control temperature value" from the predefined temperature schedule by which temperature inside the vessel an outside of the container is controlled.

In view of the foregoing, applicant respectfully submits that Dodrill does not teach all of the limitations recited in Claim 1. More specifically, Dodrill does not teach a method of

processing a food product where wherein cooling the food product includes "actively reducing the control pressure according to a predefined pressure schedule, said pressure schedule comprising a plurality of predetermined control pressure values, each control pressure value corresponding to a control temperature value included in the temperature schedule and being less than a theoretical total pressure related to the corresponding control temperature value, the theoretical total pressure being calculated from a theoretical vapor pressure based on the corresponding control temperature and a theoretical partial air pressure based on the corresponding control temperature," wherein the control temperature is "within the vessel and outside of the closed container." Put more simply, Dodrill does not teach controlling the pressure inside the container according to the temperature inside the vessel and outside of the container. Further, one of ordinary skill in the art would have found no apparent reason to modify the teachings of Dodrill to include these missing features.

For at least the foregoing reasons, applicant respectfully submits that Claim 1 is in condition for allowance. If Claim 1 is allowed, then Claims 2-5 and 7-9, which depend therefrom, should also be allowed.

Claim 10

Independent Claim 10 recites the following:

10. A method of batch processing a food product located in a closed container having a paperboard material component, the method comprising:

(a) closing the container using a packaging method whereby at least one edge of paperboard material is exposed to the conditions exterior to the container, and placing the closed container in a retort vessel;

(b) conducting a cooking phase within the vessel;

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(c) conducting a cooling phase within the vessel, during which a pressure exists within the vessel and a pressure exists within the paperboard material at the at least one exposed edge; the temperature within the vessel and outside of the container being reduced during the cooling phase according to a predefined temperature schedule, said temperature schedule comprising a plurality of predetermined control temperature values;

(d) wherein the cooling phase includes actively controlling the pressure within the vessel and outside of the container according to a pressure schedule, said pressure schedule comprising a plurality of predetermined control pressure values corresponding to the control temperature values included in the temperature schedule, the control pressure values being less than a theoretical total pressure related to the corresponding control temperature value, the theoretical total pressure being calculated from a theoretical vapor pressure based on the corresponding control temperature and a theoretical partial air pressure based on the corresponding control temperature, so that the pressure in the vessel is less than the pressure in the paperboard material, thereby helping to prevent moisture from entering into the exposed edge of the paperboard of the container, the control pressure values being sufficient to prevent the closed container from bursting.

For at least the reasons set forth above with respect to Claim 1, applicant respectfully submits that Dodrill does not disclose each and every limitation of Claim 10. In this regard, Dodrill does not teach controlling the pressure within the container during a cooling phase according to the temperature inside the vessel and outside of the container. More specifically, Dodrill does not disclose a cooling phase with "the temperature within the vessel and outside of the container being reduced during the cooling phase according to a predefined temperature schedule, said temperature schedule comprising a plurality of predetermined control temperature values," wherein the cooling phase "includes actively controlling the pressure within the vessel

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and outside of the container according to a pressure schedule, said pressure schedule comprising a plurality of predetermined control pressure values corresponding to the control temperature values included in the temperature schedule, the control pressure values being less than a theoretical total pressure related to the corresponding control temperature value, the theoretical total pressure being calculated from a theoretical vapor pressure based on the corresponding control temperature and a theoretical partial air pressure based on the corresponding control temperature." Further, Dodrill provides no apparent reason to modify the teachings of Dodrill to include such features.

For at least the foregoing reasons, applicant respectfully submits that Claim 10 is in condition for allowance. If Claim 10 is allowed, then Claims 11 and 13-15, which depend therefrom, should also be allowed.

Claim 16

Independent Claim 16 recites the following:

16. In a method of processing a container comprising a fiber-based material, the container containing a food product and having at least one exposed edge of fiber-based material, the method including placing the container in a retort vessel, conducting a cooking phase within the vessel, and conducting a cooling phase within the vessel; an improvement to conducting the cooling phase comprising:

(a) reducing a temperature within the vessel and outside of the container according to a predefined temperature schedule, said temperature schedule comprising a plurality of predetermined control temperature values; and

(b) actively controlling a pressure within the vessel and outside of the container according to a pressure schedule, said pressure schedule comprising a plurality of predetermined control pressure values corresponding to control temperature values of the

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temperature schedule, each control pressure value being less than a theoretical total pressure related to the corresponding control temperature value, the theoretical total pressure being calculated from a theoretical vapor pressure based on the corresponding control temperature and a theoretical partial air pressure based on the corresponding control temperature, so that the pressure within the vessel and outside of the container is less than a pressure in the walls of the fiber-based container during the cooling phase, thereby helping to prevent moisture from entering into the exposed edge of the paperboard of the container, the pressure within the vessel and outside of the container being sufficient to prevent the container from bursting.

For at least the reasons previously set forth with respect to Claim 1, applicant respectfully submits that Dodrill does not teach controlling pressure during a cooling phase according to the temperature inside the vessel and outside of the container. More specifically, Dodrill does not teach "reducing a temperature within the vessel and outside of the container according to a predefined temperature schedule, said temperature schedule comprising a plurality of predetermined control temperature values" and "actively controlling a pressure within the vessel and outside of the container according to a pressure schedule, said pressure schedule comprising a plurality of predetermined control pressure values corresponding to control temperature values of the temperature schedule, each control pressure value being less than a theoretical total pressure related to the corresponding control temperature value, the theoretical total pressure being calculated from a theoretical vapor pressure based on the corresponding control temperature and a theoretical partial air pressure based on the corresponding control temperature," as recited in Claim 16.

In view of the foregoing comments, applicant respectfully submits that Claim 16 is in condition for allowance. If Claim 16 is allowed, then Claims 17-20, which depend therefrom, should also be allowed.

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Closure

For at least the reasons set forth above, applicant respectfully submits that Claims 1-5, 7-11, and 13-20 are in condition for allowance. An early and favorable action allowing these claims is respectfully solicited. The Examiner is requested to contact the undersigned by telephone at 206.695.1651 with any questions regarding this matter.

Respectfully submitted,

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